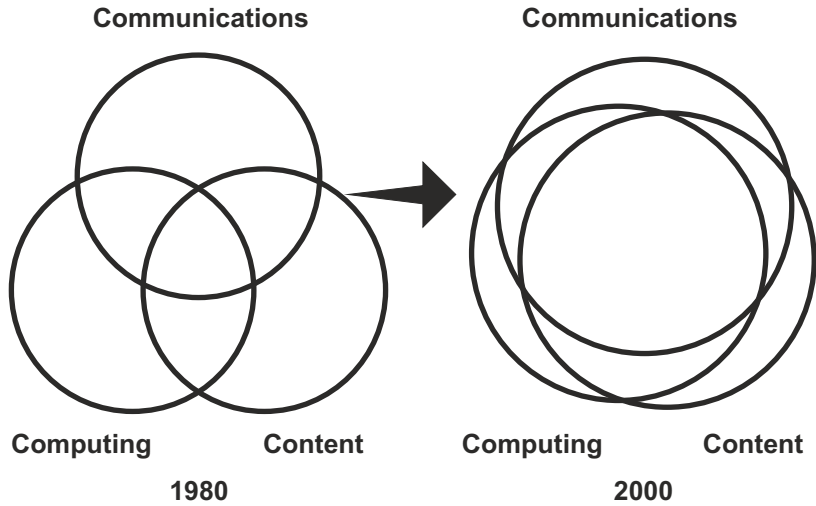


Future Trends in Print Media

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Almost two decades back I was attending a seminar on what will happen to print on paper when the digital media grows? We were just beginners in the industry and opted printing technology as our passion and career. So the outcome of this discussion was very important to me being print as my passion. Many scientists predicted the death of print on paper and the rise of digital media. Ironically I attended similar seminars and conferences many times in the last two decade and the topic remain same but nothing happened and print industry grows in leaps and bounds. During the last DRUPA-2008 I decided to study and project a trend line to the future of printing and try to understand how this industry is going to transform. Primarily I conducted an analysis of the growth of print industry in the global and regional scenario in relation to the global population and its regional distribution. I could convince myself that print is going to grow in a very big manner. Normally print industry grows almost double to the GDP in the developing countries. It was very interesting to know that India is going to witness maximum growth compared to any individual country in the world from 2006 to 2012 touching almost 24 billion Euros. Off course there will be technological revolutions but printing is going to grow and not the way some predicted the death of print. Letter press has taken the reincarnation with a new body and name as flexography basically remaining the soul same. Similarly offset has proven its ability to transfer an image the most smooth and consistent way. Thus many digital ads today say "We print with offset quality" accepting offset quality is better and they even engaged an offset blanket to transfer the digitally formed image. So I strongly believe offset process will continue in a very strong way in the coming years too. Once I was convinced that Inkjet, flexo and digital is going to grow in a very appreciable way in the future, I decided to understand how these technologies are



going to transform the future media industry.

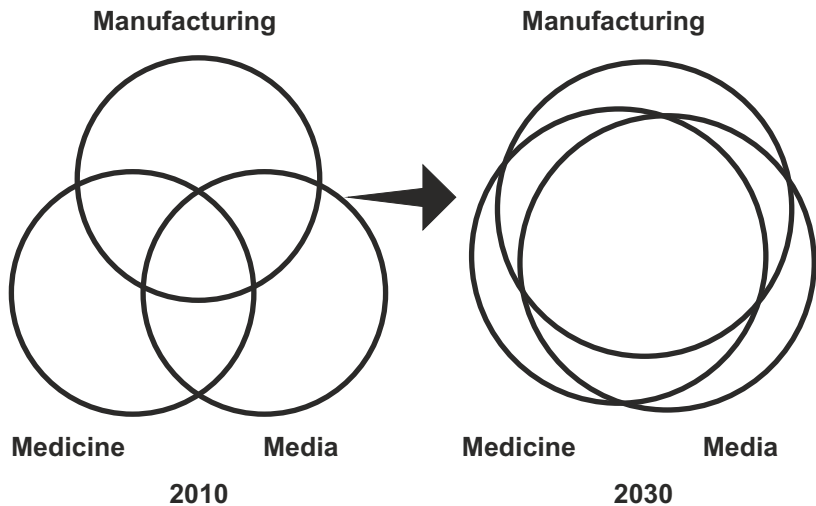
During these days I happened to come across the works of Prof. Christopher Barnett from Nottingham University, UK. He redefined the theories of industrial convergence proposed by Dr. Nicolas Negroponte, Director of the Media Lab at the Massachusetts Institute of Technology (MIT), USA, in the early 1980's where he discussed to understand how the industry convergence theories are related to the technology innovation and further development.

The New Industrial Convergence:

Later the new convergence theory proposed by Prof. Christopher Barnett

(Associate Professor in Computing & Organizations at Nattingham University Business School) Suggests 3 M's are going to converge namely Media, Medicine and Manufacturing.

- * Digital systems and the Internet will continue to drive industrial convergence in the years to come.
- * Today already most of the activities of the industries involve the manipulation and exchange of digital information
- * Prof. Christopher Barnett redraw Negroponte's famous diagram and he labeled the three broad industry sectors as
- * Media, Manufacturing & Medicine.
- * As we approach 2010, these areas of



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human activity have already started to share some common ground.

- * Further as represented in the diagram in the next side you can see that by 2030 they will have a strong significant overlaps.

I was really confused how this is going to happen since each industry is different in structure and differ in all aspects. To understand this concept better I asked few questions myself:

- * How the media industry is going to restructure ?
- * What are the new applications?
- * How we can correlate the new industry convergence diagram with the future of print media?
- * How to do the smooth transition and carry out the technology management?
- * What is the significance of knowledge with proper understanding?

Later I identified the following applications of printing technology to correlate the industrial convergence theory:

3D-Printing (Cubic Printing)

Definition:

3D or Cubic printing is the technology that uses special printers for solid three dimensional object creation. The printers build each model layer by layer, starting at the base.

Some Features:

Models may be printed with a clear binder or in full color.
Models may have interlocking parts such as chains.
Thin models can be infiltrated with an elastomer to make flexible parts

Printed Electronics:

Definition:



Printed electronics (PE) can be defined as the application of printing technology on all printed and potentially printed electronics and electrical accessories (*Printed electronics is a 300 Billion US\$ business*)

Products:

Displays, solar cells, memory gadgets, transistors, sensors, lasers, adhesive tapes, wall papers, billboards, labels, skin patches, smart packaging, Gaming, Antennas, Low cost RFID, Packaging, E-Paper and books because it will be affordable, foldable, thin, conformal, wide area, low cost, edible, rollable, transparent and bio degradable as needed. One of the major future application is mobile phone manufacturing.

Nono Technology (Quantum Dots)

Definition:

Quantum dots are nanometer sized semiconductor crystals with unique properties. A Non- Traditional Semiconductor with Superior Anti-counterfeiting Capabilities.

Important properties:

Size and composition dependent band gap which can be tuned atom by atom during fabrication to emit at any visible or infrared wavelength
Broad, tunable absorption pattern with absorption peaks
Emission intensity that depends on excitation wavelength
Sharp Emission peaks
Extreme form of flexibility permits to incorporate easily into paints, inks, plastics, paper, coatings and optical gratings.

How it works as a perfect anti-counterfeiting technique:

Given the intricate factors which control both emission intensity and wavelength, including size, composition, and excitation frequency; any anti-counterfeiting mechanism using quantum dots would be exceedingly difficult for a counterfeiter to duplicate, without possessing both exact knowledge and technical understanding of each of the properties. Such knowledge would be difficult to empirically determine, and could conceivably vary from product to product, making illegal duplication of quantum dot products an expensive and time-consuming effort worth little even

in the unlikely event of success.

Biometrics in Printing:

What is Biometrics?

Biometrics is automated methods of recognizing a person based on a physiological or behavioral characteristic. Some of the features include measurements of ; face fingerprints, handwriting, hand geometry, iris, retinal, vein, and voice.

How document printing can be protected?

Security is more than just passwords on your desktop and every organization knows physical security is also equally important. However, within a department there is normally not much to protect documents from users already in the building and that can later cause trouble.

The most obvious problem comes when a document is printed on a shared printer. Even a document that originated on a secure desktop within a locked office becomes vulnerable when it is sent to a printer down the hall. Just because someone works with you doesn't mean they have the same need or right to read a document. Moreover, there could be cleaners or other visitors in the area. By the time you get to the printer, someone might have read or taken your sensitive document. Secure printing is a feature we will see on a lot of new printers. When a user prints a document, they are usually asked to assign it a code, which must be entered via a keypad on the printer to release the job.

Future Applications:

Future of biometrics will include, e-commerce applications for extra security on the final checkout page, and biometrics will guard against unauthorized access to cars and cell phones and printing machines. In the future, biometric technology will further develop 3-D infrared facial recognition access control, real-time facial recognition passive surveillance, and visitor management authentication systems. Already "[A4Vision](#)" a provider of 3-D facial scanning and identification software uses specialized algorithms to interpret the traditional 2-D camera image and transfer it into a 3-D representation of a registered face. This makes it almost impossible to deceive the biometric system with still photos or other images. You can see that all the above applications have a direct

or indirect application in print industry.

E-Paper, E-Ink & Espresso Book Making Machine.

An Electronic Paper Display (EPD) is a display that possesses a paper-like high contrast appearance, ultra-low power consumption, and a thin, light form. It gives the viewer the experience of reading from paper, while having the power of updatable information.

EPD's are technology enabled with electronic ink - An ink that carries a charge enabling it to be updated through electronics. Electronic ink is ideally suited for EPDs as it is a reflective technology which requires no front or backlight which is viewable under a wide range of lighting conditions, including direct sunlight, and requires no power to maintain an image.

How It Works?

E-ink is a proprietary material that is processed into a film for integration into electronic displays. Although

revolutionary in concept, it is a straightforward fusion of chemistry, physics and electronics to create this new material. The principal components in this are millions of tiny microcapsules, about the diameter of a human hair. In one incarnation, each microcapsule contains positively charged white particles and negatively charged black particles suspended in a clear fluid. When a negative electric field is applied, the white particles move to the top of the microcapsule where they become visible to the user. This makes the surface appear white at that spot. At the same time, an opposite electric field pulls the black particles to the bottom of the microcapsules where they are hidden. By reversing this process, the black particles appear at the top of the capsule, which now makes the surface appear dark at that spot.

To form an E-Ink electronic display, the ink is printed onto a sheet of plastic film that is laminated to a layer of circuitry. The circuitry forms a pattern of pixels

that can then be controlled by a display driver. These microcapsules are suspended in a liquid "carrier medium" allowing them to be printed using existing screen printing processes onto virtually any surface, including glass, plastic, fabric and even paper. Ultimately electronic ink will permit the surface to become a display, bringing information out of the confines of traditional devices and into the world around us.

At the end of the study I was totally convinced that these applications are going to change the whole face of printing industry from a skill based industry to a knowledge driven industry in the coming days which is going to change the whole world in to a new era.

My only suggestion to our fellow members of media industry is to awake and be ready for a change. Printing industry will be the most prominent and promising industry after the weapon industry in the future days.

Be proud to be a Printer! Since you are going to change the whole world!